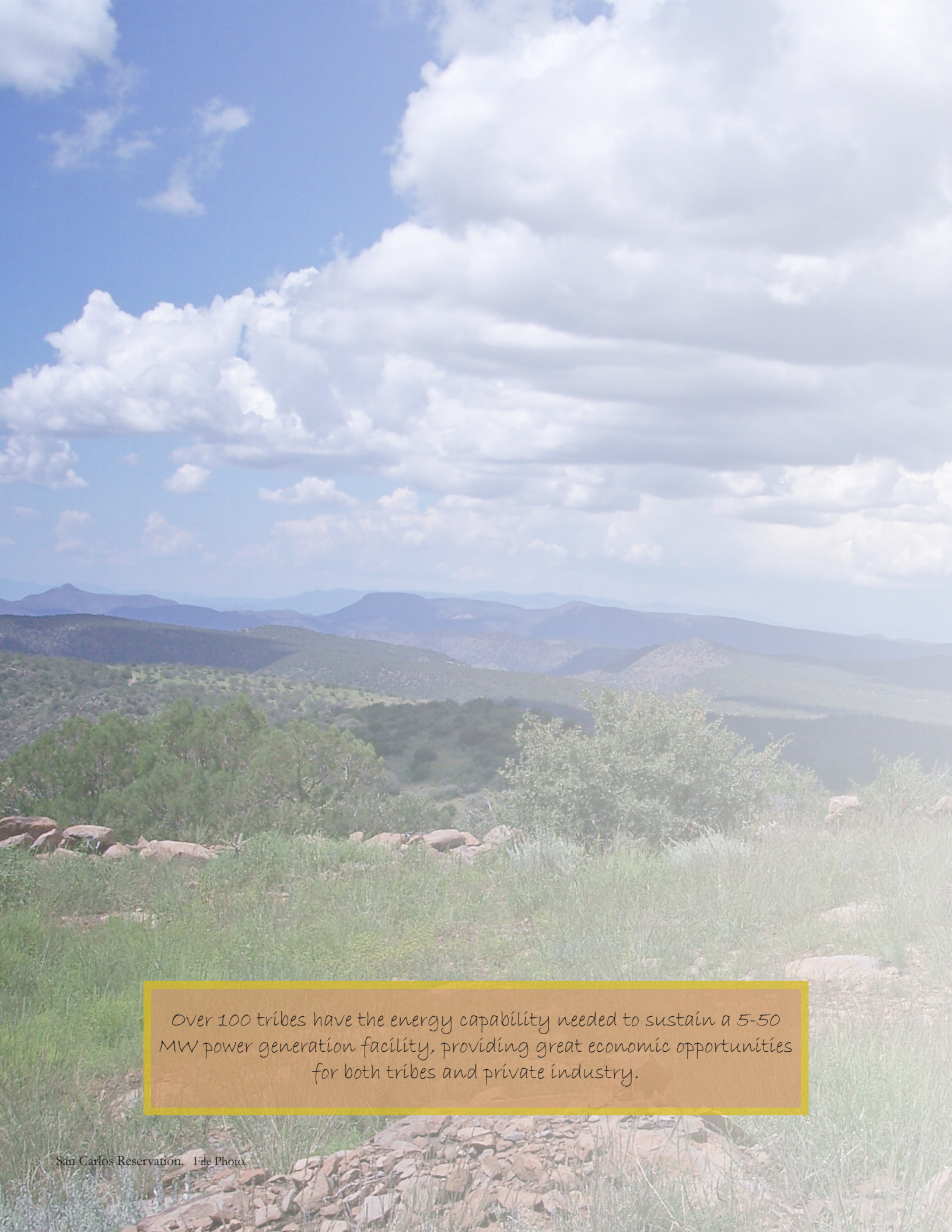
Office of Indian Energy and Economic Development
The Division of Energy and Mineral Development

GREEN JOBS IN INDIAN COUNTRY

Using Renewable Resources to Provide Sustainable Economies



Over 100 tribes have the energy capability needed to sustain a 5-50 MW power generation facility, providing great economic opportunities for both tribes and private industry.

San Carlos Reservation. File Photo.

INTRODUCTION

Unemployment runs high in Indian country. To find solutions that help Indians attain sustainable economies, many tribes are looking at the potential for renewable energy development on their lands that can create more job opportunities.

Renewable energy relies on the natural flow of wind, running water, sunshine, and the earth's heat. These concepts have always been a part of the American Indian's traditional ways. Everything from biomass (the earth's living matter) to geothermal resources can be developed on tribal lands.

By harnessing renewable energy, tribes can reach a sustainable energy future while preserving important links to their past.

Pursuing renewable energy development will ultimately create more jobs and income for tribes aggressively working to pull their people out of poverty.

Working on Indian lands is affordable, labor forces are available, transportation systems are in place on many reservations, tax benefits for companies are available, and energy can be had at a low cost.

The Office of Indian Energy and Economic Development's Division of Energy and Mineral Development is playing a major role in achieving the current Administration's renewable energy goals by working with tribes on over 50 projects that include solar, wind, biomass, geothermal and hydropower. These projects have been well received in Indian country because they resonate with the American Indian's strong environmental ethic.

ACTIVITY IN INDIAN COUNTRY

The Division is working with Tribal leaders to develop and market available energy resources to private industry in an effort to create tribal economies centered on green jobs. Opportunities exist for tribes to build power plants on their reservations to produce electricity to sell to the grid, and develop utility scale wind farms. DEMD staff produced a wind atlas to entice wind developers and investor partners.

Tribes are also interested in encouraging manufacturing facilities to be built on tribal lands using lower cost, renewable energy. The potential exists for hydro-electric, biomass, and waste-to-energy facilities – all examples of renewable development projects that can put Indians to work.

To date, four tribes, as seen on the following pages, are at the cutting edge of renewable energy development, with more to follow. These tribes are pro-active in providing a sound economic environment for private industry to utilize and potentially co-develop these resources.

COLVILLE RESERVATION

The tribe, located in northeastern Washington, has a long history of logging and sustainable forest management planning, setting the stage for a biomass facility.

- Potential to develop a cellulose-based biomass electricity generating plant ranging from 4-14MW which could generate between $2 and $6.25 million in revenue respectively while creating between 10 and 25 jobs.

- This biomass facility could help achieve the State of Washington's RPS goals of 20 percent by December 31, 2020.

Colville Reservation. File Photo.

Annette Island Reserve. File Photo.

ANNETTE ISLAND RESERVE

Located on Annette Island on the southeastern tip of Alaska, 600 miles from Seattle, the tribe has a successful history working with industry in business endeavors such as logging and salmon fisheries.

- Two hydroelectric generating facilities are currently in operation capable of providing 4MW of power to private industry. The energy generated by these two facilities can be valued at roughly $1.78 million per year.

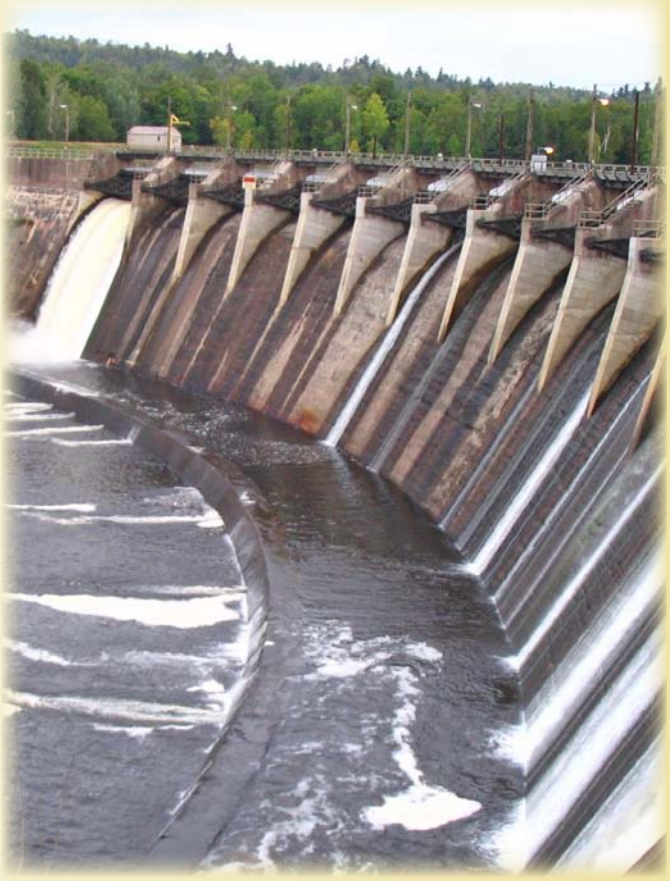
- Great potential for providing the energy needed to convert waste biomass to diesel fuel.

- The tribe has a deep water port near shipping lanes providing industry with access to markets in the lower 48 and Asia.

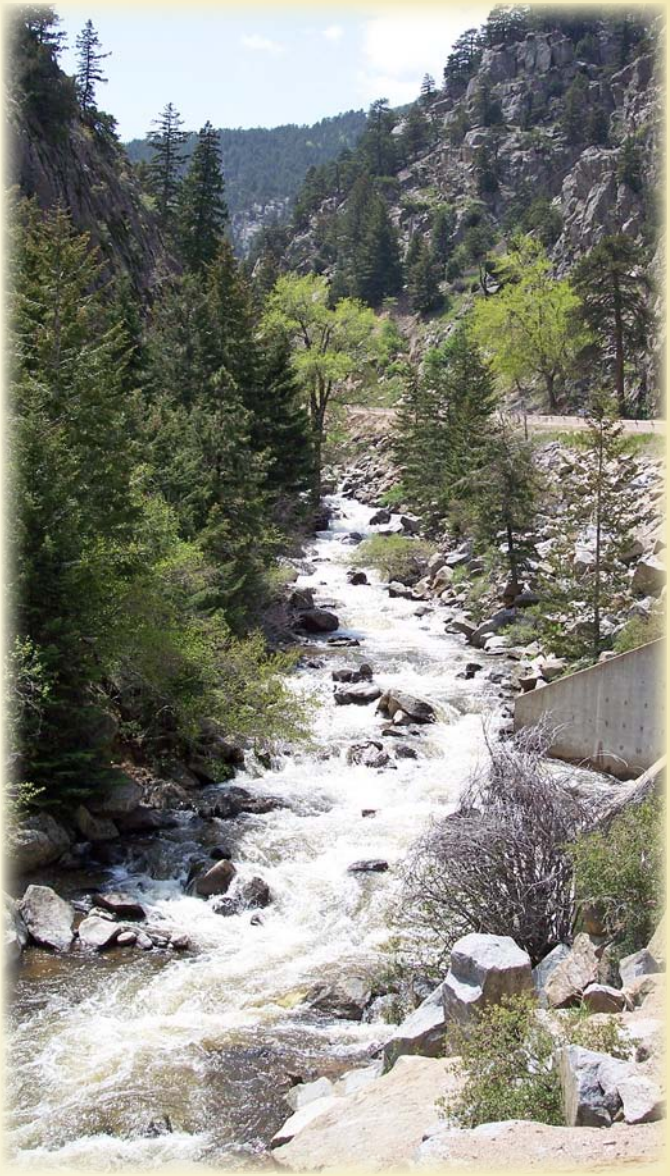
FOND DU LAC

The tribe is located 20 miles west of Duluth, Minnesota. With an active business portfolio, the tribe is open to renewable energy development opportunities.

- Potential to develop hydroelectric and biomass electricity generating facilities ranging from 2-15MW.
- A 2MW facility would generate roughly $890,000 in revenue.
- A 15MW facility would garner roughly $6.7million in revenue.
- Biomass jobs could range from 10-25 depending on the size of the facility.
- Access to rail line and Duluth, which is a major port city on Lake Superior.
- The facilities could help Minnesota achieve its Renewable Portfolio Standard of 25 percent by December 31, 2025.



Fond du Lac Reservation. File Photo.



St. Croix Reservation. File Photo.

ST. CROIX

The northwestern Wisconsin tribe is planning to build a 6MW biomass power plant at their fishery.

- Plant could create 15 new jobs with gross revenues of approximately $3.6 million annually.
- Electricity sold to local utility company will help meet Wisconsin's Renewable Energy Portfolio.

GEOTHERMAL

Geothermal energy is unlike other renewable energy sources because it does not depend on the sun or wind, but rather is derived from the natural heat of the earth. This makes it a very consistent and reliable energy resource. Energy can be produced from temperatures above 165 degrees Fahrenheit.

Technologies for electrical power generation depend greatly on the nature of the resource, the fluid temperature, the resource's salinity and content of other gases that could potentially affect plant efficiency and design.

Three primary systems are used to produce geothermal energy:

- Dry steam power plants using steam to power a turbine which drives the generator.
- Flash steam power plants using a water tank that is heated by the earth's hot water, which in turn feeds a turbine generator utilizing the water vapor that has been created within the tank.
- Binary-cycle power plants which use a heat exchanger that transfers heat from a hot water production well to a lower boiling point fluid that vaporizes and drives the turbine generator.

All of the above systems include one or more production wells and an injection well to recharge the reservoir.

DEMD is currently working with 10 tribes to develop geothermal energy. DEMD has provided funding to two Western tribes for preliminary geothermal studies and is giving technical assistance to eight others in California, Oregon, Arizona, the Midwest and Rocky Mountain Regions, and Alaska.

Several tribes have shown interest in building geothermal power plants on their lands similar to the one pictured here. Geothermal power plants emit only water vapor with no pollutants. File Photo.

BIOMASS

Producing energy from biomass– the Earth's living matter - is a renewable energy source that can be developed within Indian Country. Wood, garbage, straw, and animal waste can be burned to produce heat, or power, and can also be turned into bio-fuels. DEMD funded studies have shown that a great potential for biomass energy production exists on Indian lands, and numerous tribes have expressed interest in exploring this type of renewable energy development.

Currently, DEMD is working with 18 tribes on biomass related projects by providing funding for studies to determine the resource potential on these reservations.

Harvesting feedstock for biomass in the Apache-Sitgreaves National Forest. File Photo.

In Alaska, DEMD staff are developing direct heating operations and exploring the potential for electrical generation facilities and for facilities that could convert biomass to diesel fuel. This fuel could then be transported to Alaskan, Canadian and lower 48 markets. DEMD is also working with the National Renewable Energy Laboratory (NREL) to develop a pilot ethanol plant on tribal lands.

A 6MW biomass power plant could create 15 new jobs at $3.6 million gross annual revenues.

HYDROELECTRIC

Many reservations are currently reviewing hydropower feasibility and environmental studies. Currently, DEMD is concentrating its efforts on examining existing dam locations and evaluating the potential to generate electricity via a dam retrofit. Dam retrofitting is opportune for hydroelectric power generation because it has minimal environmental impact.

San Carlos Reservation. File Photo.

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Respecting Tradition...
While on the Path to Prosperity

Cover Photo: Colville Reservation. File Photo.
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